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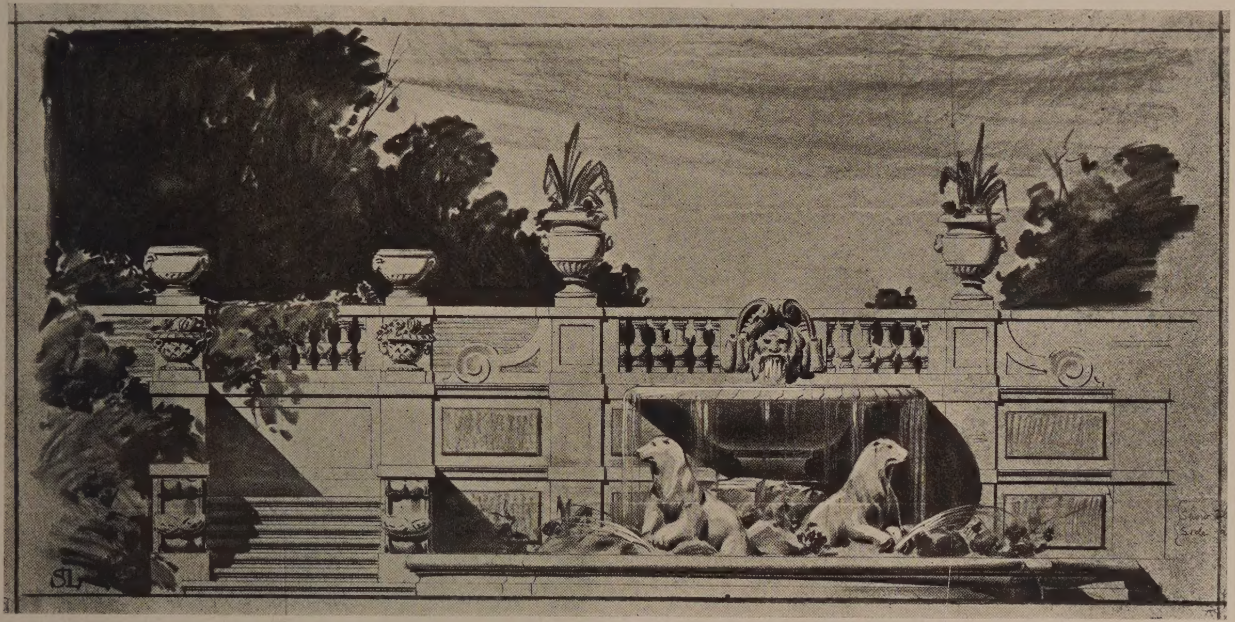


A GARDEN FOUNTAIN. STUDY IN CHARCOAL. Charles A. Platt, Architect.

I. CHARCOAL STUDIES FROM THE OFFICE OF CHARLES A. PLATT, ARCHITECT

BY JERAULD DAHLER

WHEN I first entered Mr. Platt's office a number of years ago, I was immediately struck by the unusual manner in which he studied his architectural designs. It was quite different from anything I had before encountered. Every Architect has a more or less individual way of working, but Mr. Platt's method seemed to me decidedly individual as well as extremely interesting.

In attempting an explanation of why Mr. Platt's office seemed to me different from others I had known, I should say that it was because here architecture is considered to a greater degree as an art, and that the ideal of that art is the impelling force behind all work. Every design, before it goes to the artisan for execution, is studied thoroughly. By that I intend the fullest degree of that word's implication. Mr. Platt does not guess at results. He attains them by an infinite perseverance, in conjunction with a rare eclecticism. To my mind, study is the keynote to his success.

One of the first marks of distinction in Mr. Platt's manner of studying his work is the vehicle he employs for presenting his designs for his criticism. It is the use of charcoal renderings. The æsthetic value of every important detail of a structure, in regard to which there is the slightest doubt, is put to test by being presented in charcoal form. A glance at the studies illustrated herewith, which are a few typical examples in this medium, that have been made and used in Mr. Platt's office for work already executed, or in course of construction, will convince the observer of their worth for such a purpose.

I believe the use of charcoal for architectural renderings like these, is something new. It has been my lot to have worked in a number of offices in New York and in other cities. In none of these have I found charcoal employed to any great extent for rendering purposes, nor have I been able to learn by inquiry among my Architect friends and acquaintances, of anyone who so employs it. Therefore, I believe its potentialities are, to a great extent, unknown, or at any rate, disregarded, because not understood. Aside from its novelty, the use of charcoal as a means of studying designs and details, seems to me to be of unusual interest because of the superior qualities it possesses, which make it suitable for the architectural office, compared to rival methods. First of all, it is quick and it is forceful. It is facile, it is clean, and it is a true way of expressing realistic values. These are indeed virtues in the active office of today, especially the first mentioned. It is with the hope that my fellow Architects and draftsmen will find an interest in the employment of charcoal for their work, that these studies, with Mr. Platt's generous permission, are presented for their consideration, with a few words explanatory of its uses and merits.

Studies such as these should not be classified or confused with the usual and more or less familiar architectural portrayals. Almost continually we are having brought to our attention in magazines and in exhibitions, accounts of those in our profession who have specialized in the art of architectural rendering, together with examples of their skill, varying in its scope from sketches in pen and ink, to elaborate drawings in wash and water color. These drawings are called architectural presentations. They are executed as a rule with great care and without regard to time spent in their doing. No expense is spared in order to make them as "chic" as possible, for their fundamental purpose is to be an attractive picture, with smiles to charm a doubting client or some equally doubting building committee. They are what I might term an emphatic instance of the best foot forward movement. Consequently, in large competitions, too, we never fail to see brought forth a grand collection of this type of drawing, where each man strives to outdo his rival by the "stunningness" of his offering.

The idea of employing such presentations is an old one and a useful one. However, the influence on our profession in recent years, of the Ecole Des Beaux Arts, has undoubtedly accentuated its practice as well as its importance, and it has certainly increased the standard of skill in producing it. So much so, in fact, that there has grown up a distinct class of men who specialize in this one branch of work, thus removing it, in a sense, out of the architectural profession, often to the embarrassment of that Architect who cannot afford the expensive services of such a specialist, and moreover cannot afford not to compete with him. I am open to conviction as to the merits of the French school in matters of design, but as to draftsmanship, its virtues are obviously pronounced; that is, if one is inclined to regard the clever draftsmen of today as a bona fide asset. I am inclined to regard him more as a "magician," for how often he can present a sketch of a building, very poor in design, and make it appear like a veritable masterpiece. For instance, it may not be that the superior design loses in a competition, because of inferior presentation, but on the other hand, I have never seen a large competition won by a design that was not presented extremely well, from which we may draw any conclusion we care to. In any case, this kind of rendering has grown to be an important factor for the Architect's consideration, because the quality of his work is apt to be judged by the excellence of his preliminary presentation. I regret that such is the case, since it is a false principle, but have no intention of suggesting a remedy. My idea of mentioning it here at all is to point out the distinction of that type of rendering from that of which I am going to tell you, and which is here shown, with the belief that it would work for the ultimate benefit of our art if a more simple and less deceptive method were inaugurated for the purpose of presenting embryonic designs, and the time and energy thus saved, devoted to intelligent, truthful study of actual working drawings and details.

In the first place, then, these studies were not intended to give what I might call an "artistic" effect, and so differ from such architectural presentations as I have described. The studies reproduced here were made to look as much like the actual work they represent, as possible—no better nor no worse. Flattery was not only not attempted—it was not desired, because these are the Architect's own studies, made for his scrutiny only and his own enlightenment. As Mr. Platt himself says, they are made to show the "brutal facts" about the designs.

If one of the studies, page 128 for example, were shown to a client with the explanation that it was a photographic likeness to the cornice of the entrance of his new house, the chances are, if he be the average man, it would mean absolutely nothing to him. It is but natural that we deny the lay mind the power to see the possibilities in a design from a fragmentary sketch of it, while we believe ourselves capable of doing so. But the client, who is only familiar with picturesque likenesses of houses, not with their plans, must be appealed to in a language he understands. Drawings suitable for the trained eye may not be so for the other. Deception would be ridiculous in a rendering for professional criticism. Heaven knows, the Architect is so often deceived by his own building when he sees it completed, that it would be twice folly for him to deceive himself when designing it.

The "landing" of a job, with the various methods employed in its doing, is but one of the demands made on the Architect's versatility, be it by over statement of fact or what not. After this is accomplished and the work goes under way, it becomes his duty to bring it to completion by sincere and earnest endeavor. If he has convinced his client of his ability, he is now obliged to furnish the proof, in return for the confidence placed in him, as well as to satisfy his own altruistic desires. To do this demands every energy, talent and useful agent at his command. Under the latter classification come these drawings in charcoal. They are true working studies, for they were not made until after the scale plans and elevations were completed and the contract for the work let.

That these studies are useful is evident. No matter how vivid one's imagination may be, it is extremely difficult, well nigh impossible, to know from looking at an Architect's geometric drawing of a building, exactly how that building will appear when built. It is just as the premiated plans of any undertaking, social, political, or military, are never precisely like their actual consummation, because some outside and unconsidered influences enter and bear an effect that is not foreseen. It is only by eliminating or lessening this percentage of error to a minimum that we can attain good results. Blind luck sometimes helps but should not be relied on, as I fear it often is in architectural matters, much to the sorrow of those who behold the creation.

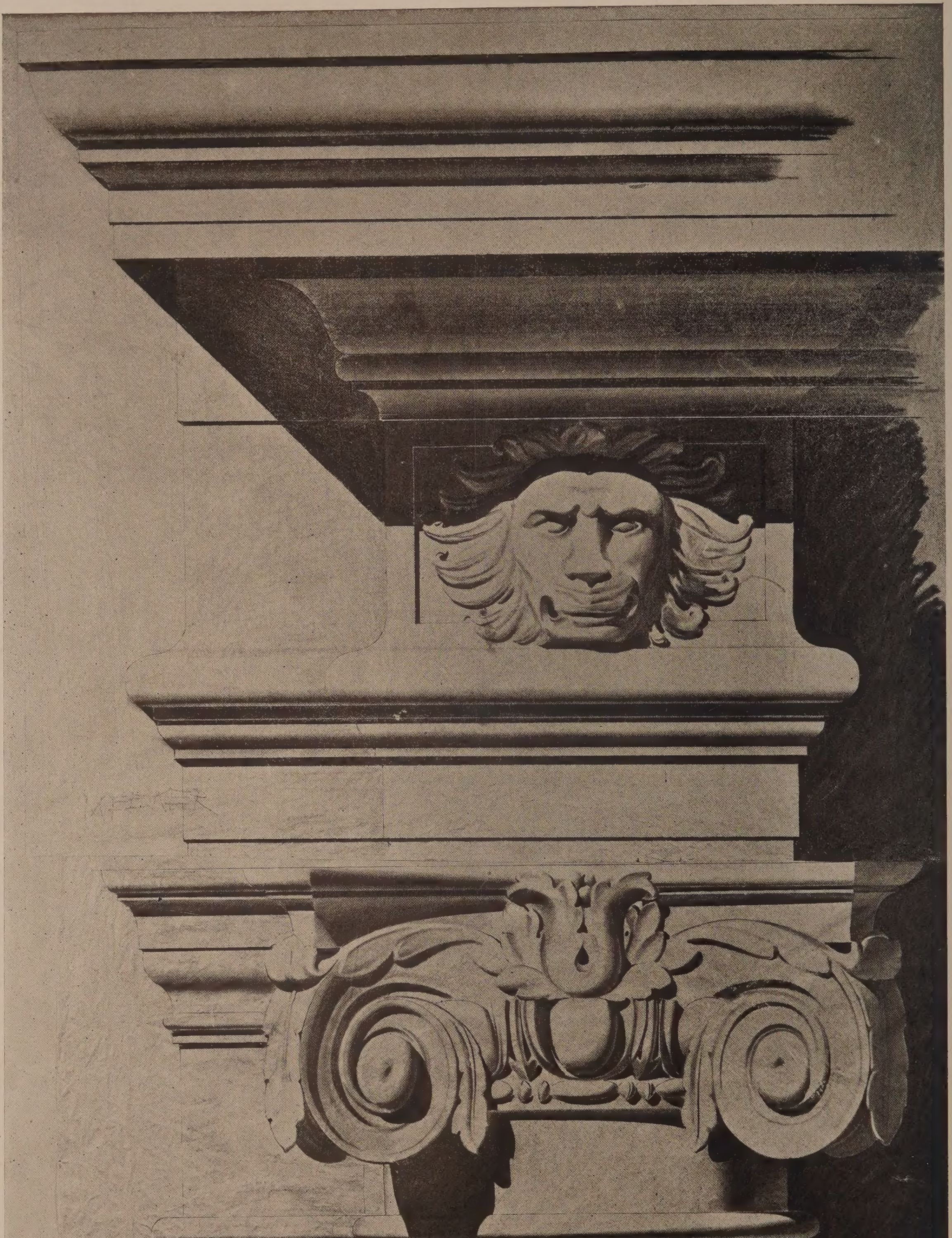
Architectural design is based on the relation of masses and voids. Therefore it is these two elements principally with which we have to work and to contend. Of course line enters in too for its share of consideration, but as it is possible to study that quite satisfactorily by means of simple line drawings, it is not of especial interest to us here. The study of the effect to be developed by the juxtaposition of masses and voids, is however, much more difficult to pursue, and any means that will lend a helping hand to the designer is welcome, since it is of paramount importance that the Architect should know as nearly as possible what the interpretation of his drawings into solid material is going to bring forth.

Already there has been brought into use for this purpose a number of agents, the best of which is doubtless a small scale model of the projected structure, made absolutely in accord with the architect's drawings. These give a perfect reproduction of the building in true proportion and show the relation of the various parts, so there is little left for conjecture. The employment of models by the profession is probably as old as it is useful. Proofs are existant that such prototypes in miniature of buildings, were employed as far back as Greek and Roman times. Today finds their service equally appreciated because of its unsurpassed benefits. However, they have one fault which is almost fatal, namely, their cost. This is indeed prohibitive, though the facility of constructing them is being increased by modern mechanical methods. Nevertheless, even now, the difficulties caused by their delicacy of construction are many and because of the expense incurred therefrom, they cannot be employed except for the largest commissions, where the cost of the building warrants it. To give an idea of the general attitude held in regard to these models, not long ago in speaking to a friend of mine, I inquired the cost of a plaster model he had had made of a projected building, which building was to cost in the neighborhood of a half a million dollars. Jokingly, he answered that he did not remember exactly, but that he believed the model cost not much more than the contract price of the structure itself. Now, of course this was absurd exaggeration, but it illustrates the point that models are no mean consideration and are decidedly out of the question for average work. Even if it were possible to have made a small scale model of a medium sized country house, for instance, larger scale models for the purpose of studying the detail, which is very important (as it is of any type of building, for that matter), would be so expensive and extravagant that it could not be hoped for from a client. Surely the Architect could not stand such expense, to be deducted from his commission, even though it apparently belongs with his services as a means for producing his designs. The percentage of clients who would realize the importance of having such a model, that is, to the point of paying for it, is, I fear, very small. When an Architect finds such a one he is indeed fortunate. My experience has been that the rate of professional services is considered very excessive—even to the point of extortion. On the contrary, as we all know too well, an Architect's commission for services is so small that it behooves him to practice the strictest economy, if he wishes his financial account to show a profit at the year's end, and this when he is required to furnish only the minimum of drawings, let alone models. These are indeed to be rated as luxuries, and as a rule, some less expensive method must be resorted to by the architect for the purpose of studying his designs.

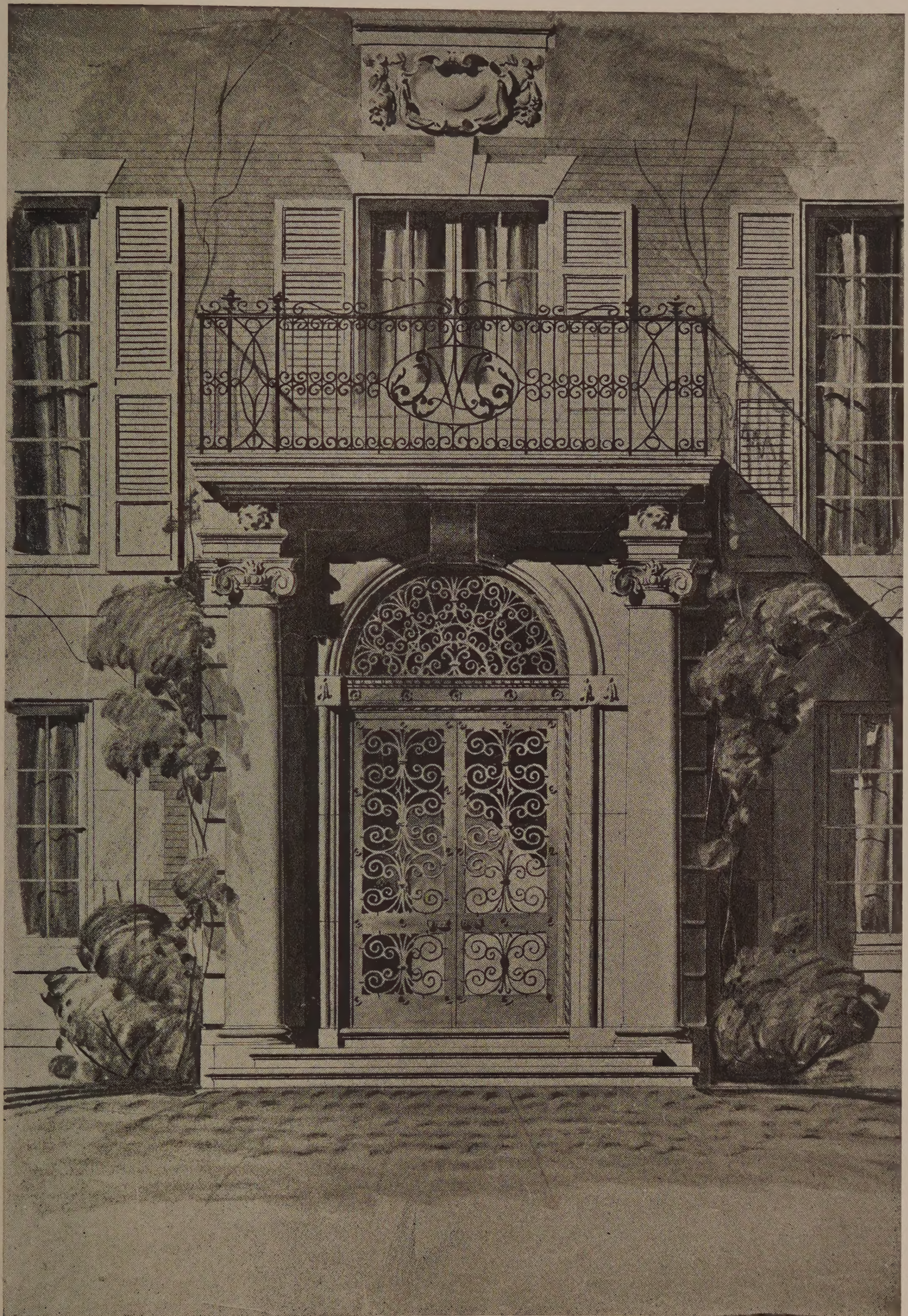
For the man who holds ideals of his art, the present system of remuneration for services is very difficult, because study is absolutely necessary to produce a good design. More than that, as work is a personal expression of its author, it is impossible to really embody one's character into his work except by thorough study. Yet, the more time and energy one devotes to his solutions of problems, and in the quest of beauty, the more it costs him in actual dollars. I think something must be wrong here in the scheme of things. It has always seemed a pity to me that an Architect is paid according to the cost, instead of according to the æsthetic merits of the structure he builds. The genius who gave to this country the University Club certainly deserved more material reward than the authors of the countless mediocre buildings, equally expensive, scattered throughout the land. The other arts (as distinguished from architecture) follow this system, and not unsuccessfully, even though the tale of the unrecognized genius starving for lack of appreciation, is ever with us. I believe it will work equally well with architecture when the time is ripe for it. The trouble is the poor old public that has been getting educated all these years, hasn't progressed yet to where they know a good building from a bad one. Consequently, why should they pay more for one than another, as long as both are good shelters, with faultless heating plants and plumbing pipes that do not leak. Of course there are some lay people who are exceptions, in fact a considerable percentage I believe. Nevertheless, the average taste in architectural matters, is unfortunately, but slightly cultivated. Despite what is said and hoped to the contrary, this is a practical age, and must be accepted as such. It remains for the Architect to do the best he can under the circumstances, as he does with the thousand and one other difficulties he has to endure.

(To be continued)

STUDY IN CHARCOAL. Charles A. Platt, Architect.

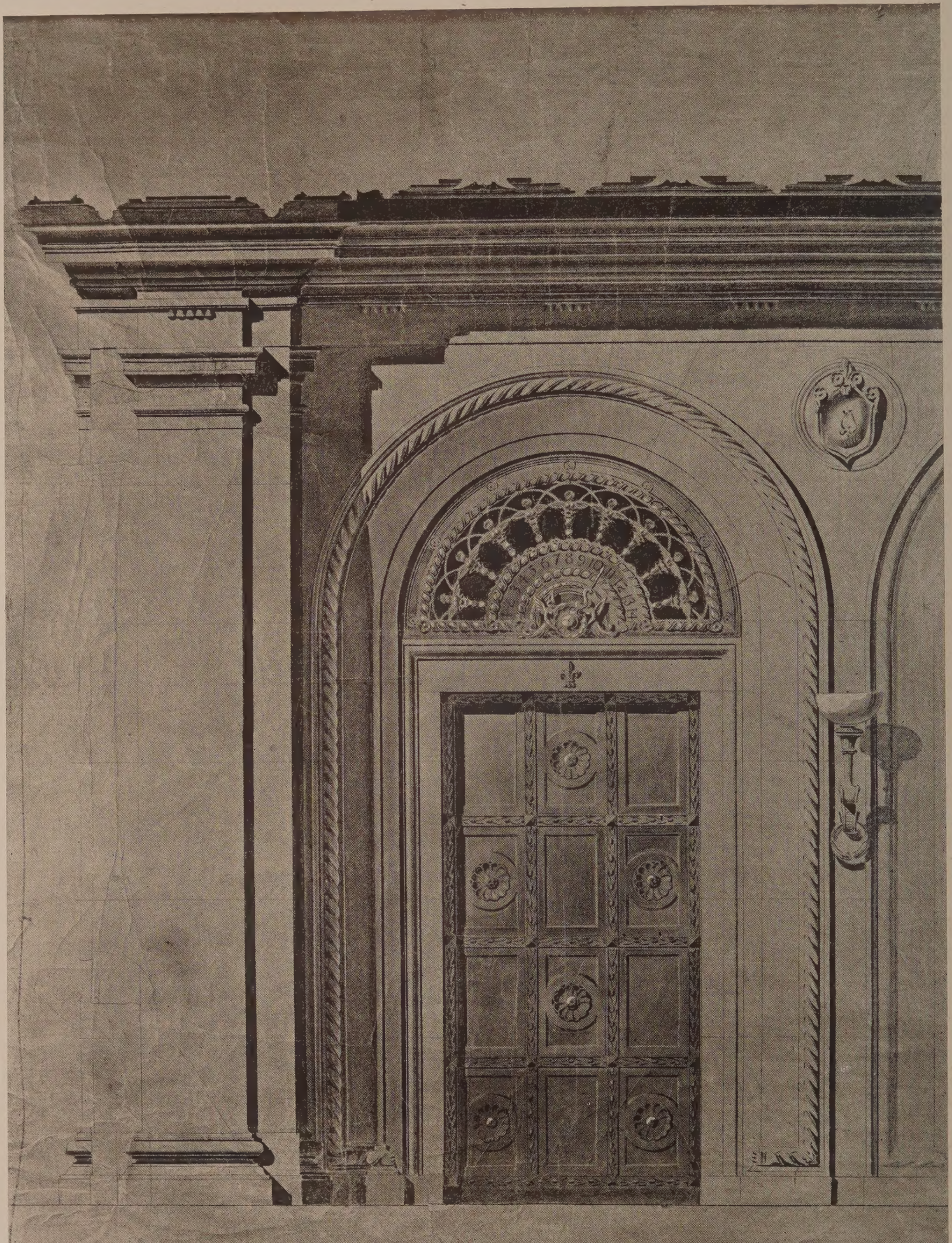


DETAIL, ENTRANCE, CITY HOUSE. STUDY IN CHARCOAL. Charles A. Platt, Architect.



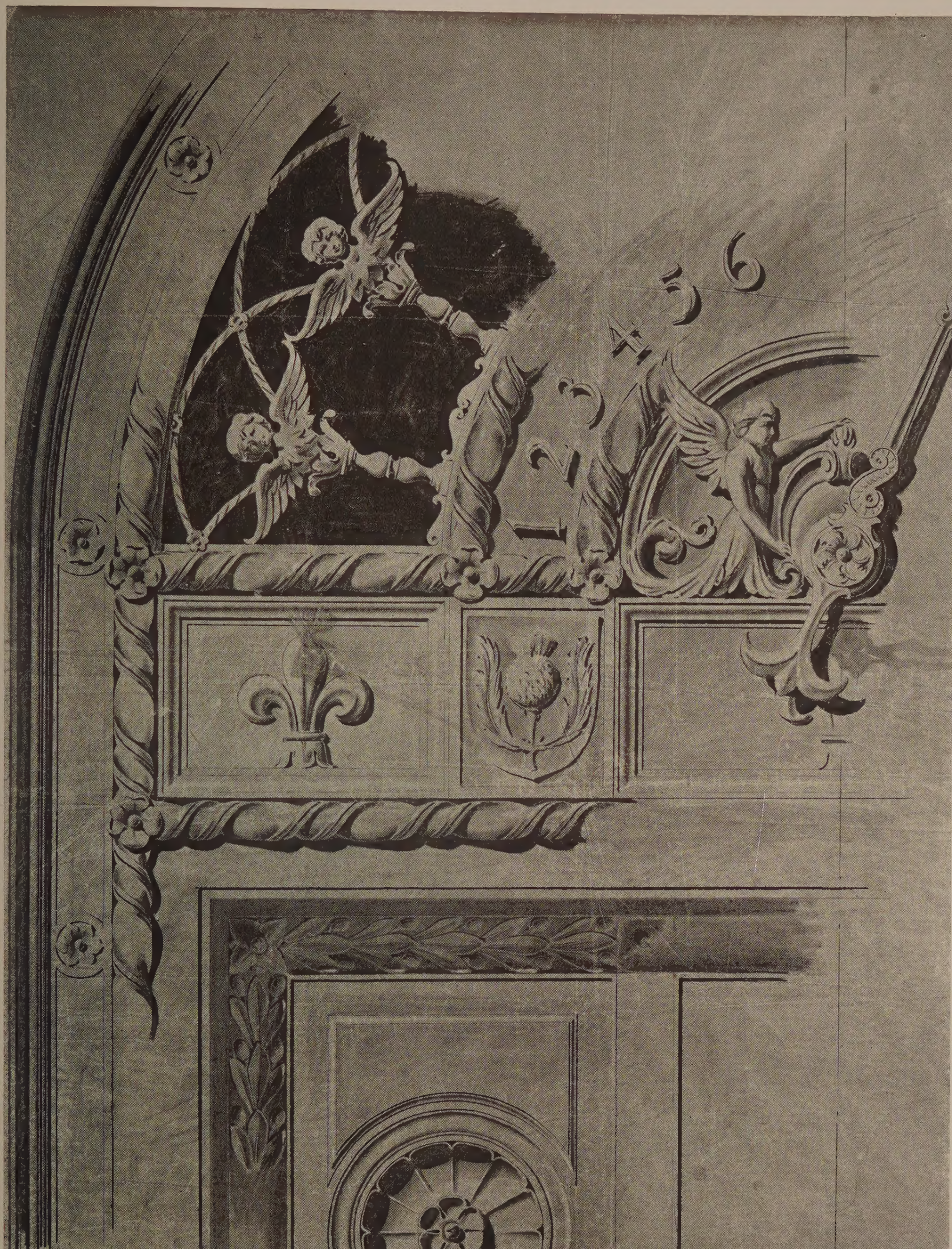
ENTRANCE, CITY HOUSE. STUDY IN CHARCOAL.

Charles A. Platt, Architect.

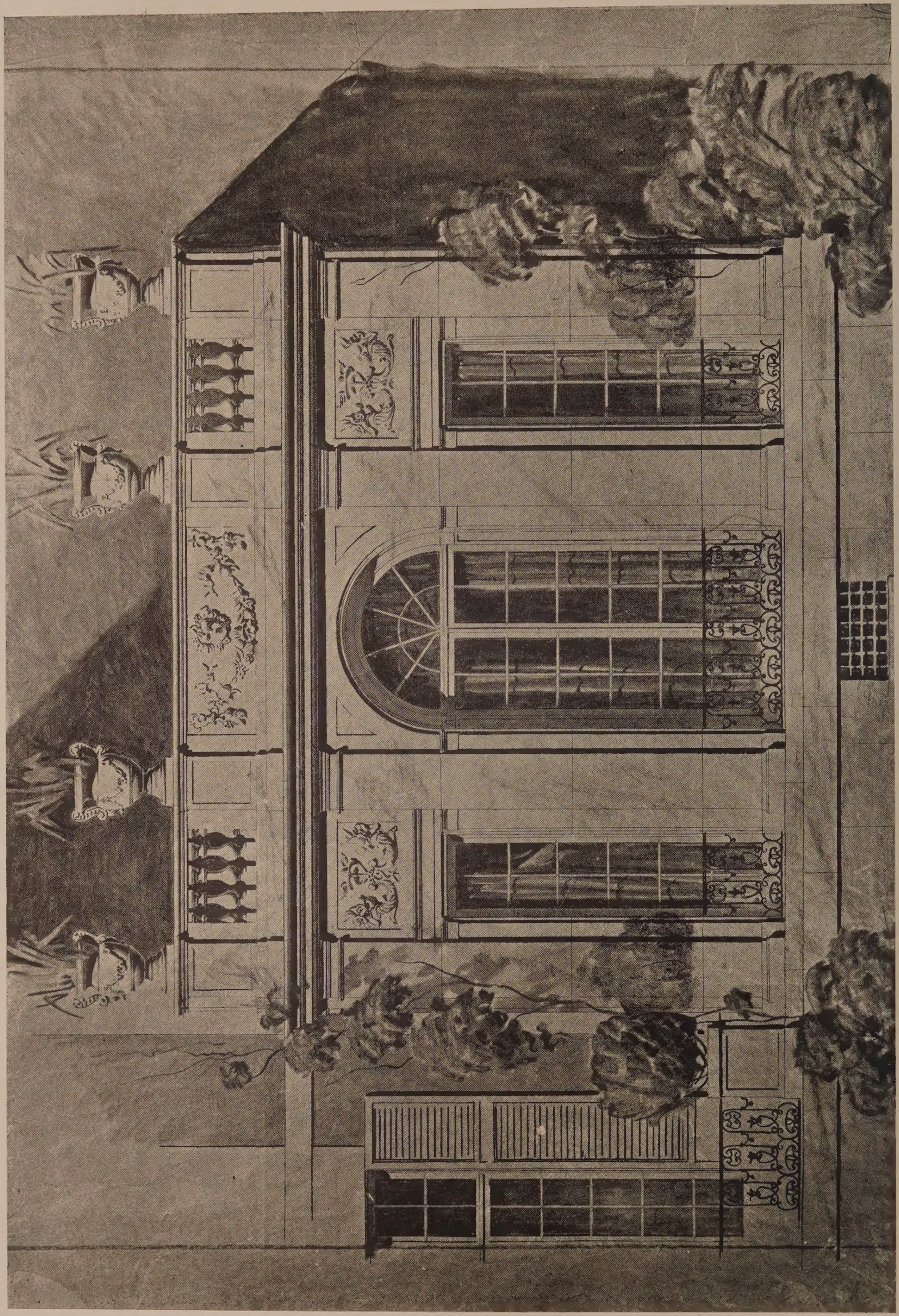


ELEVATOR DOOR, COMMERCIAL BUILDING. STUDY IN CHARCOAL.

Charles A. Platt, Architect.

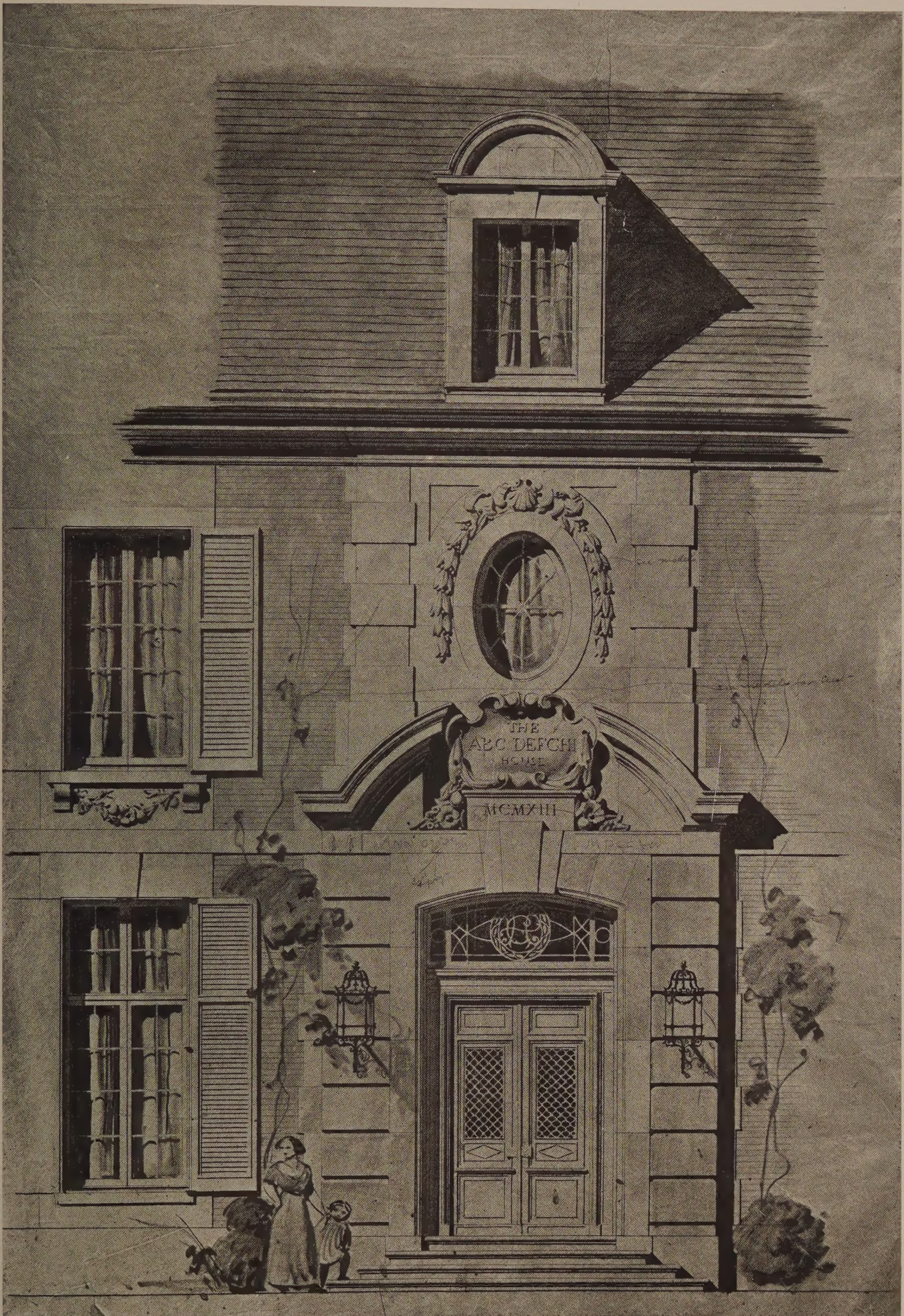


DETAIL, ELEVATOR DOOR, COMMERCIAL BUILDING. STUDY IN CHARCOAL. Charles A. Platt, Architect.

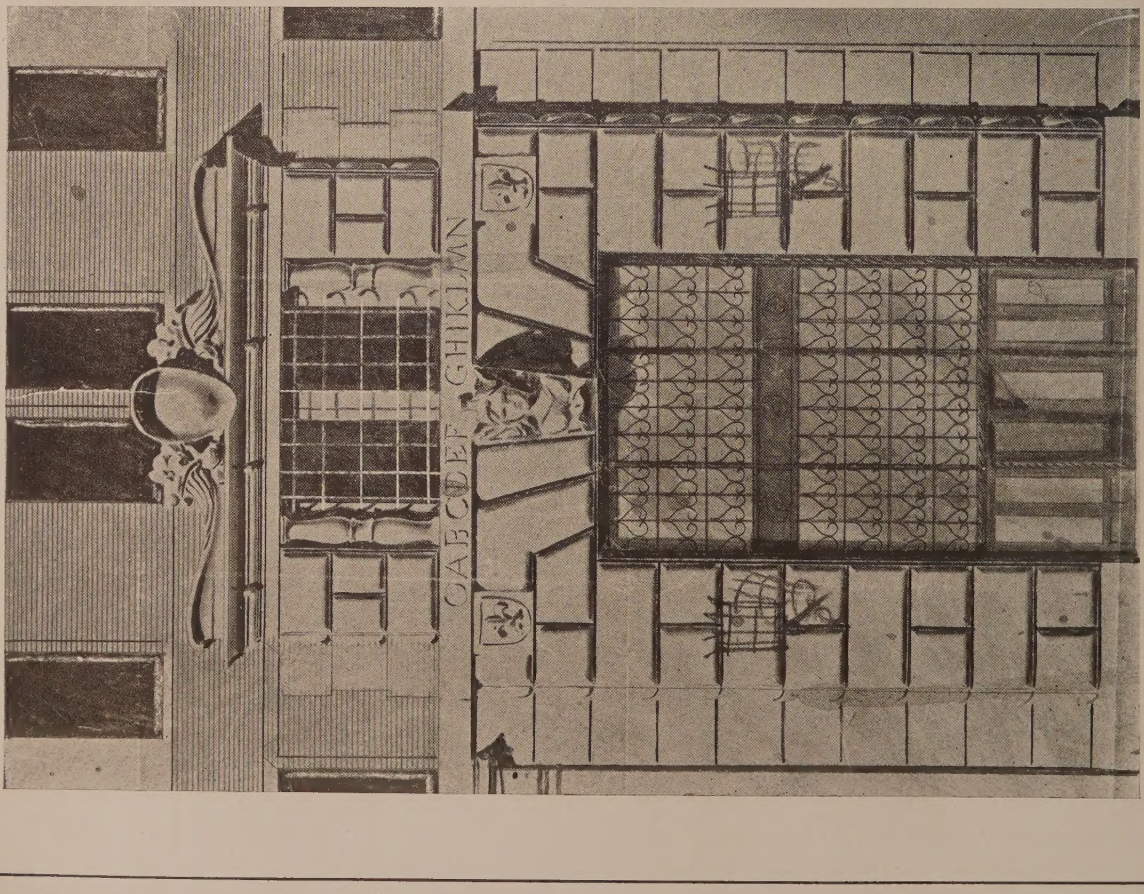


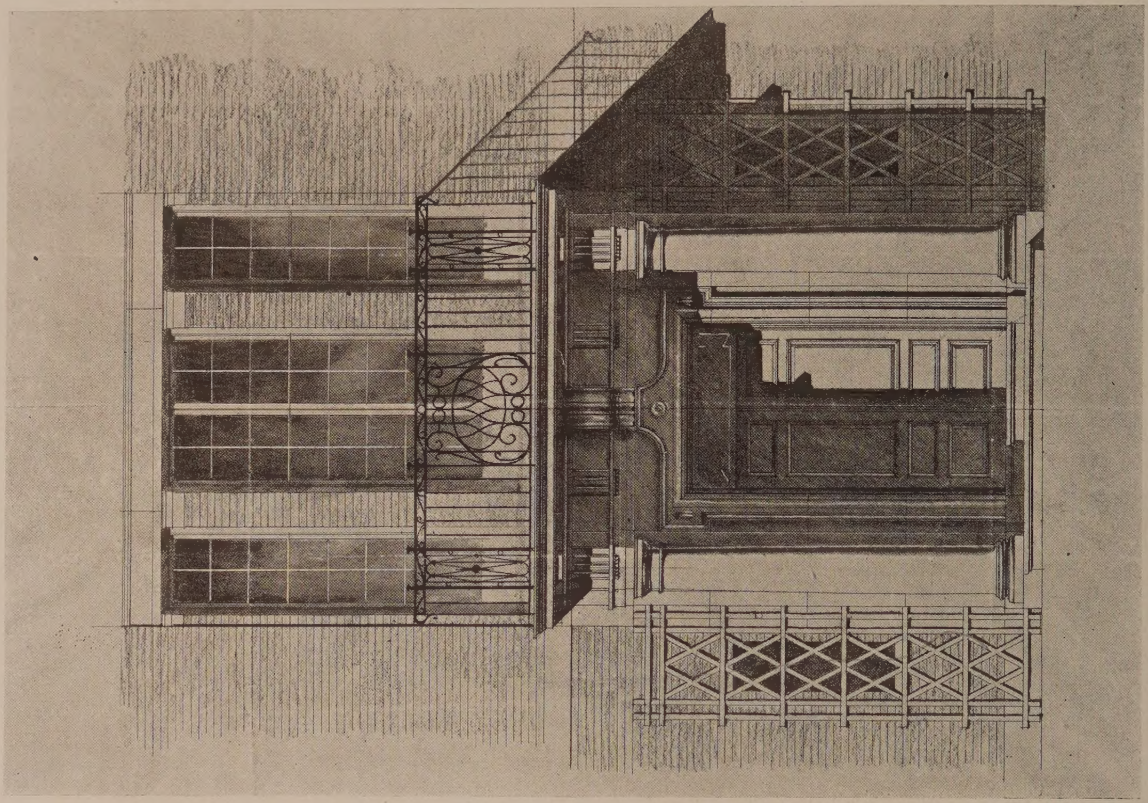
LOGGIA, COUNTRY HOUSE. STUDY IN CHARCOAL.

Charles A. Platt, Architect.



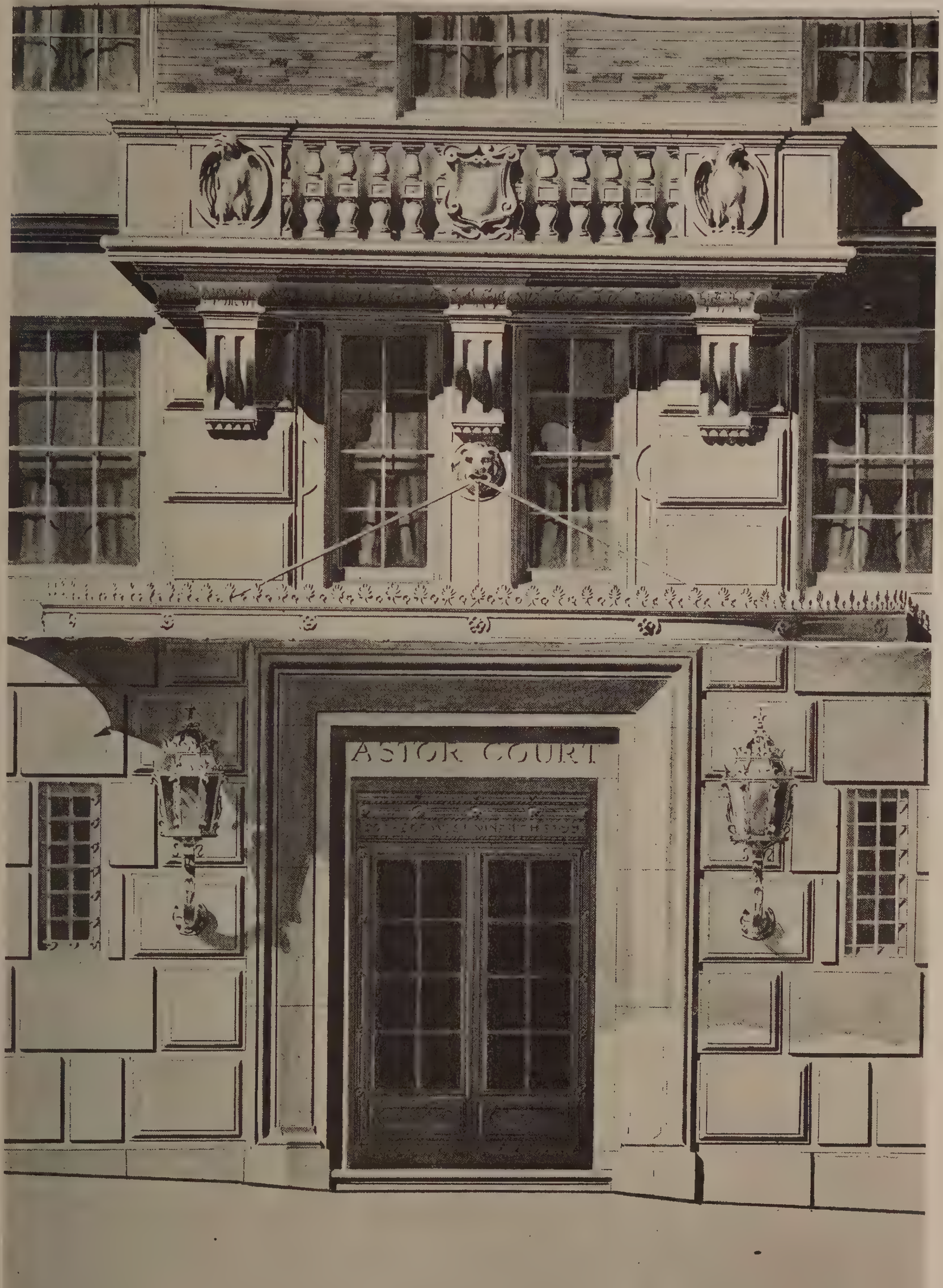
ENTRANCE, COUNTRY HOUSE. STUDY IN CHARCOAL. Charles A. Platt, Architect.



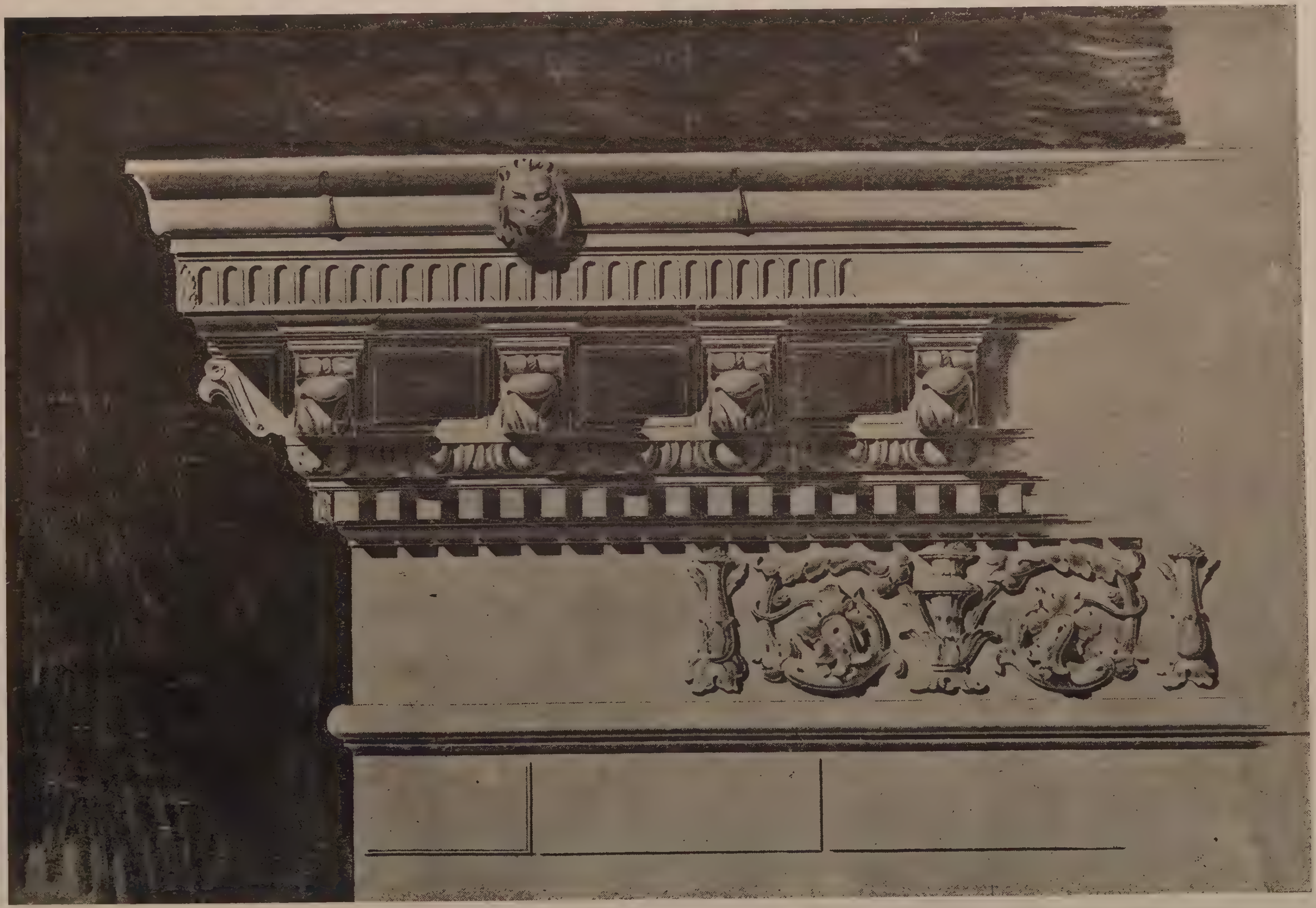


STUDIES IN CHARCOAL.

Charles A. Platt, Architect.

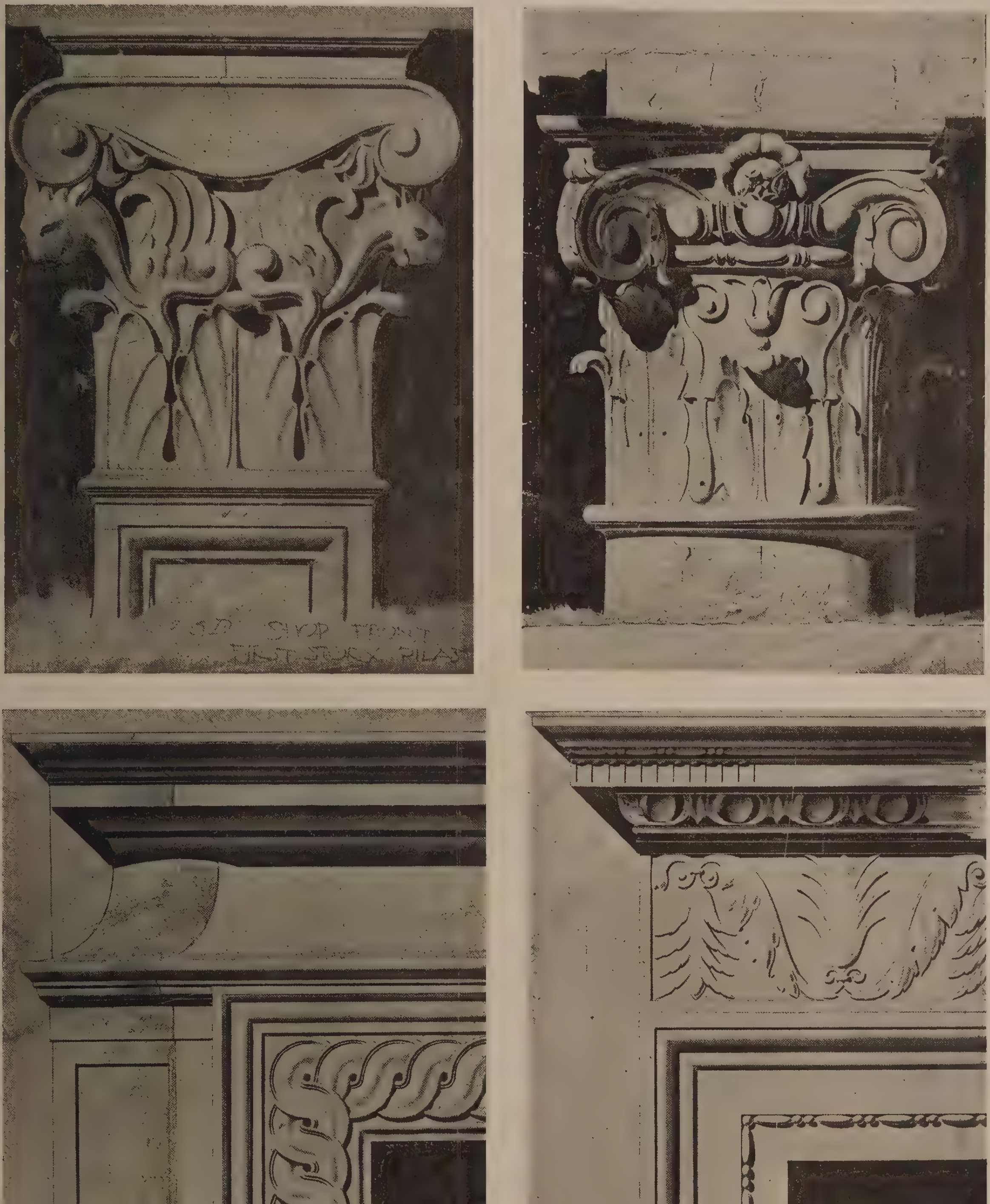


ENTRANCE, APARTMENT HOUSE. STUDY IN CHARCOAL. Charles A. Platt, Architect.

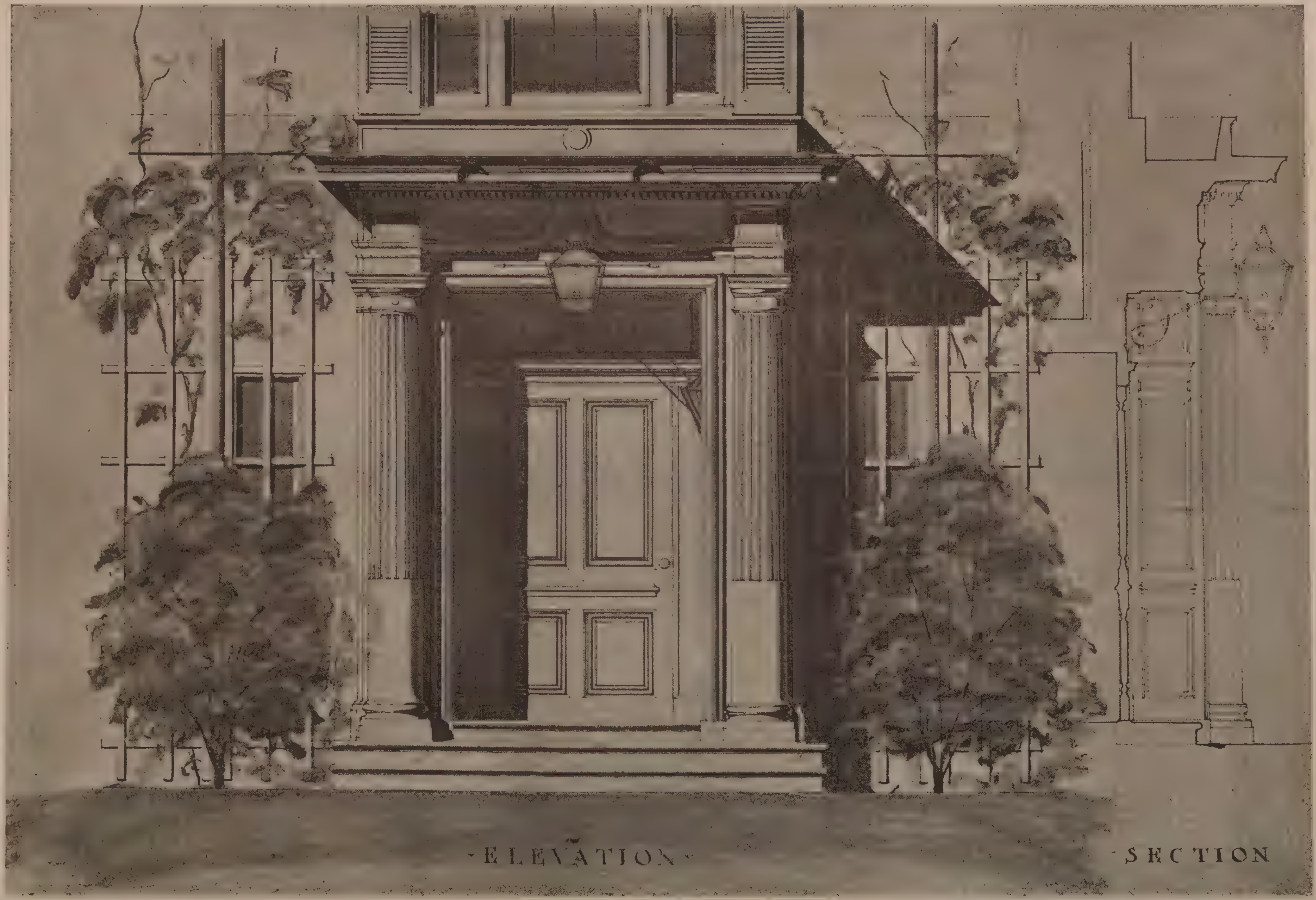


CORNICE, COMMERCIAL BUILDING. STUDY IN CHARCOAL.

Charles A. Platt, Architect.

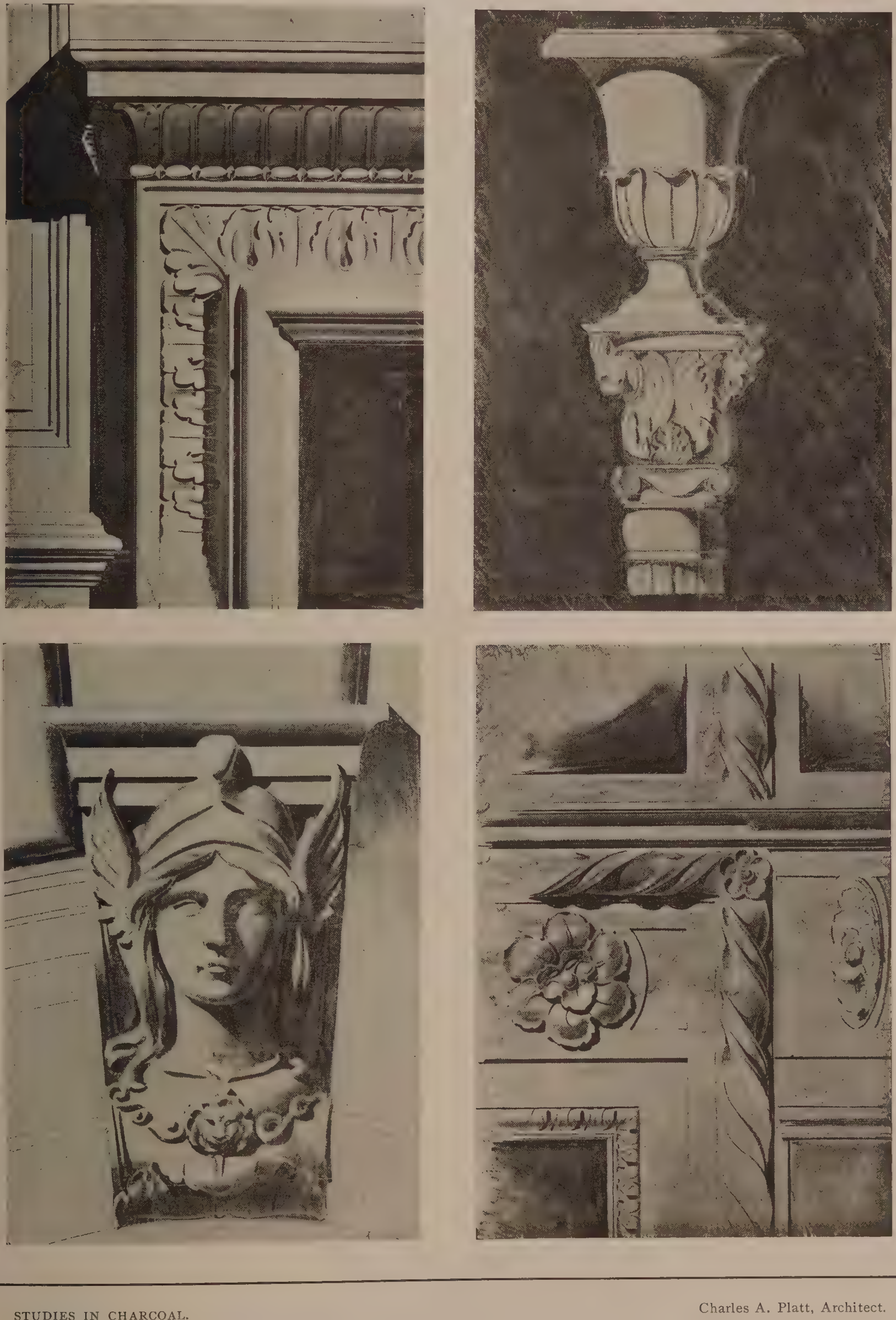


STUDIES IN CHARCOAL. Charles A. Platt. Architect.



ENTRANCE, COUNTRY HOUSE. STUDY IN CHARCOAL.

Charles A. Platt, Architect.



STUDIES IN CHARCOAL.

Charles A. Platt, Architect.

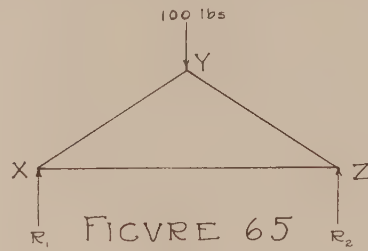
XI. ENGINEERING FOR ARCHITECTS

BY DEWITT CLINTON POND

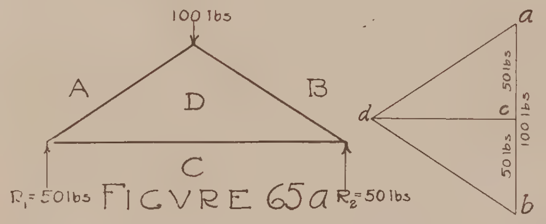
Mr. Pond has charge of the practical course in structural design at Columbia University. He is extremely successful in instructing men who have had little knowledge of mathematics, and these articles have been written with that in view.

IN the last article, the methods of determining the action of forces by means of graphical methods was considered. The most practical use to which these methods are put is that of designing roof trusses. The average Architect regards the design of trusses as a difficult matter, but there is no need of this.

A truss may be represented by a simple triangle as shown in Fig. 65 by the lines *XY, YZ* and *ZX*. Suppose a force of 100 pounds is applied at *Y*. This force is carried to the supports R_1 and R_2 through *YX* and *YZ*, and these two members are in compression. If the member *XZ* were not there, there would be an outward thrust at each reaction. *XZ* acts as a tie, holding the ends of the truss in position. This member is in tension.



FIGVRE 65



FIGVRE 65a

The problem that a designer has to decide is the exact amount of compression or tension that occurs in any particular member. In order to do this a system of lettering is employed known as "Bow's Notation."

Note the positions of *A, B, C* and *D* in Fig. 65*a*. The line *XY* now is between *A* and *D*. The line *YZ* is between *B* and *D*. The 100-pound load falls between *A* and *B*. This means that instead of using the letters at the ends of a line to designate the line, the letters on either side of it are used. In other words *XY* becomes *DA*, the force of 100 pounds becomes *AB*, *YZ* becomes *BD*, and *XZ* is known as *CD*. In Fig. 65*a* it will be seen that *X, Y* and *Z* are done away with altogether. The reactions also are lettered in this manner. R_1 is *CA* and R_2 is *BC*. The diagram in which these letters are shown is known as the *truss diagram*. To the right of the truss diagram, Fig. 65*a*, is another known as the *stress diagram*.

When the stress diagram is drawn the use of Bow's Notation becomes apparent. The three known forces are the two reactions and the downward load. On the stress diagram lay off *ab* parallel to *AB* and equal to 100 pounds. In order to find the stresses in *DA* and *BD* draw a line through *a* parallel to *AD*, and one through *b* parallel to *BD*, and the point of intersection of these lines must be *d*. By measuring *da* or *bd* the magnitude of the stresses in the compression members can be determined. The amount of tension in the lower member can be found by drawing a line through *d* parellel to *DC* and a line through *a* which is parallel to *CA*. This last line will coincide with the line *ab*. The point of intersection of the vertical with the horizontal line must be *c*. By measuring *cd* the stress in *CD* is determined.

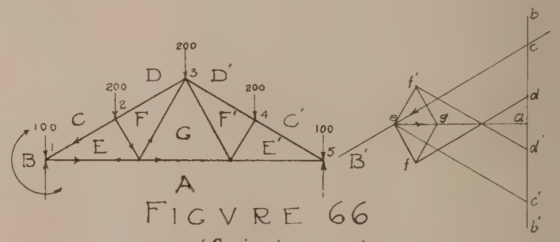
Once *c* is established the amount of weight coming upon the supports is known. It has already been pointed out that *CA* and R_1 are the same, and this is true of *BC* and R_2. *ca* and *bc* are both given in the stress diagram. It will be noted that *bc* equals *ca* and that each equals one-half of *ab*. As the load *AB* is placed directly in the center of the span, it is plain that each reaction must equal one-half the load.

In all the work in which graphical methods are employed the lines that give the magnitude of stresses, in the stress diagram, must be parallel to the members in which the stresses exist in the truss diagram. In other words, *ab* is parallel to *AB*, *bc* to *BC*, and *cd* to *CD*.

All trusses are not as easily developed as the one given above. The principles of determining the stresses in the members are, however, exactly the same in all. The truss shown in Fig. 66 is known as a "Fan Truss" and can be used to span over openings of from 20 to 35 feet. The points numbered *1, 2, 3, 4* and *5* are known as *panel points*, and the load upon the truss is generally considered as acting as concentrated loads at these points. For purposes of demonstration let it be assumed that a force of 100 pounds acts at *1*, a force of 200 pounds at *2*, another at *3*, and so on as shown in the figure. The truss diagram is lettered as shown according to Bow's Notation.

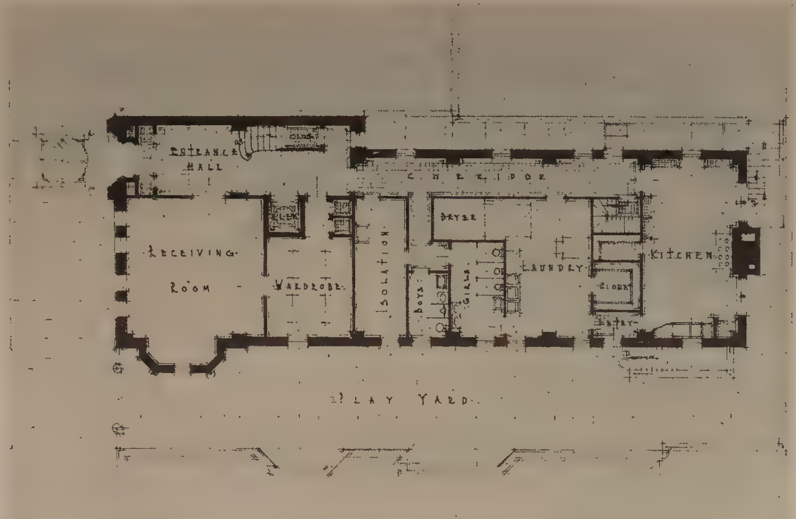
The next step is to lay off the stress diagram, starting with the forces already known. These forces are *BC, CD, DD'*, etc. The reactions are also known and so the point *a* can be established, *ab* being one-half the length of *bb'*.

The unknown forces are found by considering each joint separately. Start at the first panel point and read the forces in a *clockwise* direction. This means that the order in which the forces are read is that indicated by the arrow (Fig. 66) and corresponds to the direction taken by the hands of a clock. In other words the forces acting at the first panel point are read as follows: *AB, BC, CE, EA*. Looking at the stress diagram, *ab* and *bc* are known. *ce* is not known but its direction is parallel to the upper chord of the truss and the point *c* is known. Draw a line through *c* parallel to *CE* and continue it indefinitely. Neither is *ea* known, but *a* is established, and it is obvious that if *ea* is parallel

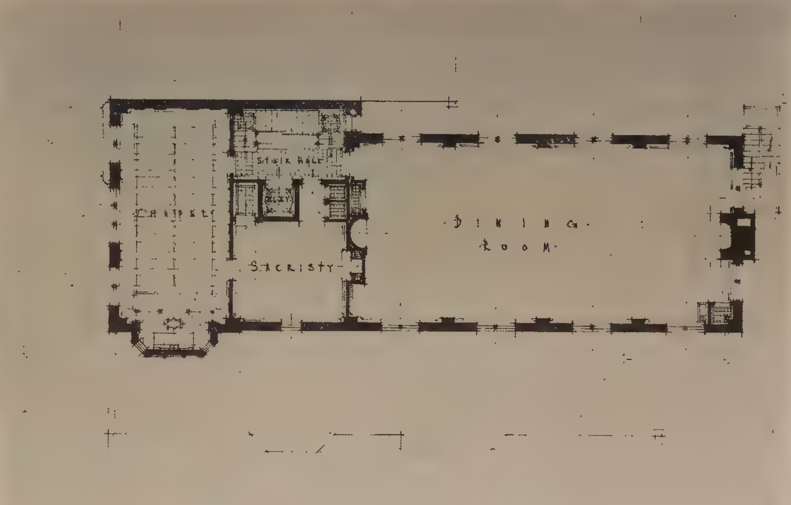


FIGVRE 66

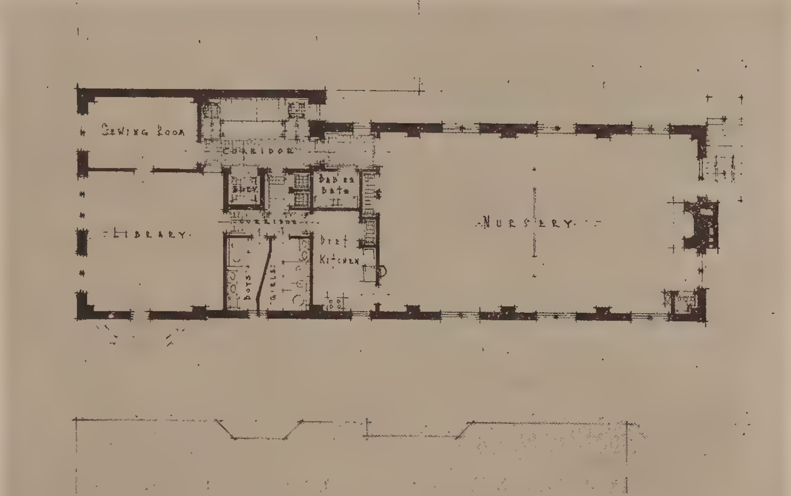
(Continued page 142)



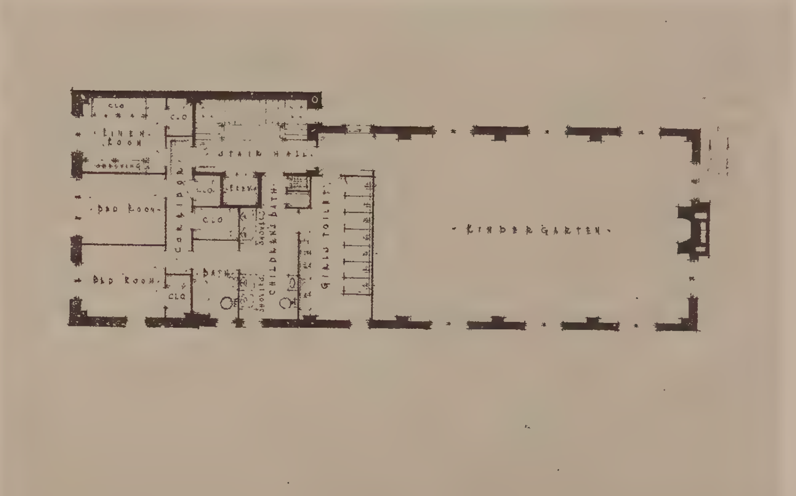
GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



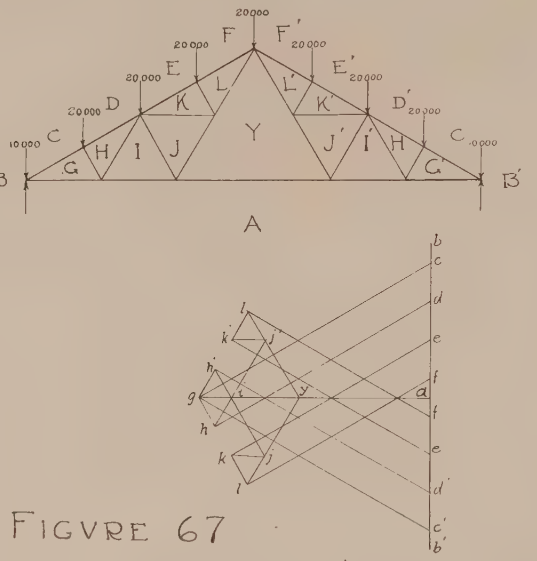
THIRD FLOOR PLAN

PLANS, ST. IGNATIUS LOYOLA DAY NURSERY, 240 EAST 84TH ST., NEW YORK.

W. Weissenberger, Jr., Architect.

(*Continued from page 140*)

to *EA* it is a horizontal line, so by producing a horizontal line through *a* until it intersects the line through *c*, the point *e* is found. *e* is common to both *ce* and *ea* and therefore, the intersection of the two lines gives the point that was to be found. By scaling the length of *ce* and *ea* the magnitude of the stresses in the corresponding members of the truss are found.



FIGVRE 67

In order to tell whether these stresses are compressive or tensile forces a very simple process is employed. As the forces are laid off on the stress diagram, *ab* is read up. This stands to reason as *AB* is the left reaction—R_1—and therefore acts up. *bc* is *down*. *ce* acts down and to the left. If an arrow is placed on *CE* indicating the direction in which *ce* is read, this arrow must point toward the panel point around which the forces are taken. This means that *CE* is in compression. When the direction is *toward* the joint the stress is compressive.

ea is read from left to right. An arrow head indicating this direction on *EA* is away from the panel point. This means that *EA* is in tension. When the direction is *away* from the joint the stress is a tensile stress. The fact that *CE* is in compression and *EA* is in tension is apparent even without this demonstration.

Next consider the stresses and the force acting at the second panel point. *ec* is known. *cd* is also laid off on the stress diagram. The only things known about *df* are the point *d* and the direction. Draw through *d* a line parallel to *DF*. The next member to be found is *fe*. The point *e* is established and through it draw a line parallel to *FE*. The intersection of the two last lines gives the point *f*.

The next two stresses to be found are those in *FG* and *GA*. In order to do this consider the stresses around the joint in the lower member. *ae* is known, and so is *ef*, but only the directions of *fg* and *ga* are given. Through *f* and *a* draw lines parallel to *FG* and *GA*, respectively, and the intersection establishes the point *g*.

By the methods already outlined the stresses in all the other members of the truss can be determined. The complete diagram is shown in Fig. 66.

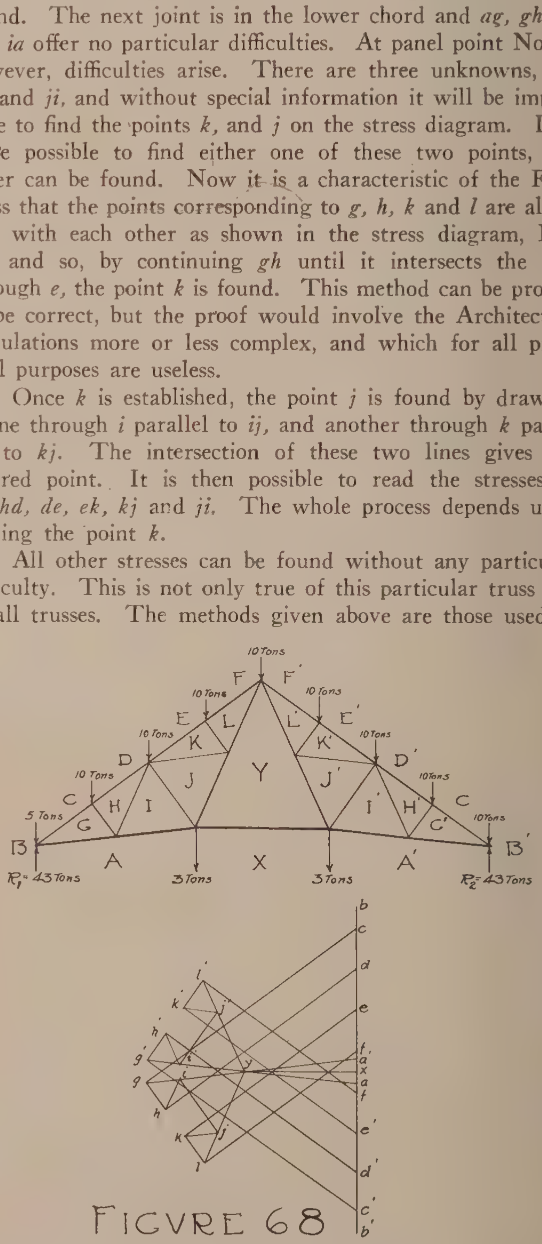
To find whether *EF* and *FG* are in tension or compression it will be necessary to follow around the stress diagram in the same manner as before. Reading around the joint in the lower chord, *ae* is read *away* from the joint and is a tensile force; *ef* is toward the joint and is, therefore, a compressive force; *fg* and *ga* are both read away from the joint and so both *FG* and *GA* are subject to pulls of the magnitudes given in the stress diagram.

A diagramatic representation of a Fink truss is shown in Fig. 67 and as this type of truss is somewhat different from many others it will be considered next. All the loads are considered as acting at the panel points as in the truss already considered. The downward loads are *BC, CD, DE, EF, FF*, etc. The upper reactions are *BA* and *AB*. As the truss is symmetrically loaded the reactions will be equal and each will equal one-half the total load. The point *a* on the stress diagram falls half way between *b* and *b'*, and all the other loads are laid off in exactly the same manner as in the other examples.

The next step is to determine the stresses in the members at the first panel point. *ab* is known and so is *bc*. *cg* and *ga* can be found in the same manner as *ce* and *ea* were found in Fig. 66. *gc, cd, dh* and *hg* are also easily found. The next joint is in the lower chord and *ag, gh, hi* and *ia* offer no particular difficulties. At panel point No. 3, however, difficulties arise. There are three unknowns, *ek, kj*, and *ji*, and without special information it will be impossible to find the points *k*, and *j* on the stress diagram. If it were possible to find either one of these two points, the other can be found. Now it is a characteristic of the Fink truss that the points corresponding to *g, h, k* and *l* are all in line with each other as shown in the stress diagram, Fig. 67, and so, by continuing *gh* until it intersects the line through *e*, the point *k* is found. This method can be proved to be correct, but the proof would involve the Architect in calculations more or less complex, and which for all practical purposes are useless.

Once *k* is established, the point *j* is found by drawing a line through *i* parallel to *ij*, and another through *k* parallel to *kj*. The intersection of these two lines gives the desired point. It is then possible to read the stresses in *ih, hd, de, ek, kj* and *ji*. The whole process depends upon finding the point *k*.

All other stresses can be found without any particular difficulty. This is not only true of this particular truss but of all trusses. The methods given above are those used in



FIGVRE 68

designing the most complicated arched trusses or those having unsymmetrical loads. A condition in which there are loads on the lower member is shown in Fig. 68, and the only new problem is the method of laying off these loads. It will also be noted that the members *AG* and *AI* are not horizontal. This form of Fink truss is sometimes given the name of French truss, and is useful when headroom is required.

The loads are laid off, to begin with, in much the same manner as before, until the point *b'* is reached. The next force, *b'a'* is the reaction R_2. In all previous examples this has been laid off on the stress diagram equal to one-half the distance *bb'*. In this case *b'a'* is equal to *more* than one-half *bb'*. As the loads are symmetrical, R_2 is equal to one-half the *total* load or 43 tons. Note that the 3 tons on the lower chord is figured in this reaction. The point *a'* falls just under *f*. *a'x* is the next force, and *xa* and *ab* bring one back to the starting point *b* again.

Once these forces are laid off in order and according to a very logical arrangement, the work of finding the stresses in the members of the truss is undertaken. *ab, bc* and *cd* are laid off as usual but it will be noted that *ga* is *not* horizontal. The only horizontal line in the stress diagram is *yx* and *YX* is the only horizontal line in the truss diagram. In the diagrams for both Fink trusses it is well to note that *l* and *j* and *y* are all in line. This relation serves as a check.

The stress diagrams that have been given so far have been developed to give the stresses in all the members of the truss. There is no need of this in actual practice, and usually only one-half the diagram is shown. It will be noted that *a'g'* is the same length as *ag*, and the same relation holds good throughout the entire diagram.

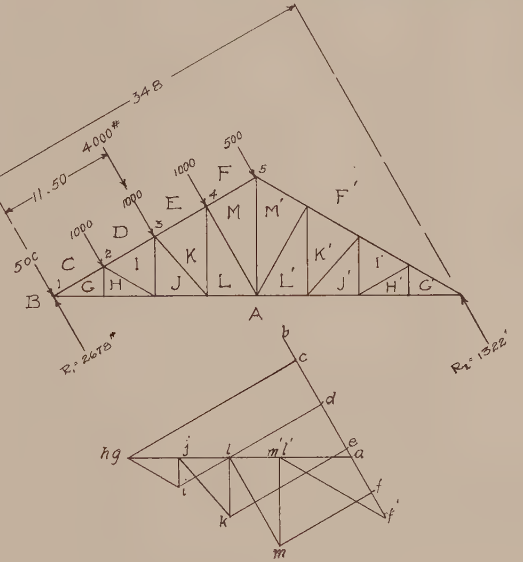
All the forces that have been mentioned so far have been downward loads. In case wind loads are to be considered a new element enters into the design. The usual method is to determine the stresses due to the vertical forces and then draw a second stress diagram in which the wind loads only are taken into account.

These wind loads are considered as acting at the panel points in exactly the same manner as the dead loads. The method of determining them will be considered later. The direction of these loads is always taken as perpendicular to the upper chord of the truss. This condition is shown in Fig. 69. The determination of the stresses in the members depends upon the manner in which the ends of the truss are held. In mill construction both ends of a truss are fixed and this is true of many trusses that are used in building construction. When one end of the truss is anchored to a masonry wall the other end may rest upon an iron plate to allow for expansion and contraction. When a truss is over 70 feet in length the free end is often placed upon rollers. The need of this is apparent if one considers the difference in temperature between summer and winter and the expansion that may take place in 70 feet of steel.

When both ends are fixed the reactions act in a direction opposite to the wind loads, that is, perpendicular to the upper chord of the truss. The stress diagram is laid off in much the same manner as those already considered except the loads are not vertical. There is only need for one diagram for all forces and stresses are the same whether the wind blows from the right or left.

The important difference between this condition and those given above is that it is necessary to determine the reactions. In the case of a simple beam the method of finding R_2 was to determine the total downward moment around R_1 caused by the loads, and to divide this by the span. Exactly the same process is employed in reference to the truss. The total wind pressure is 4,000 pounds which may be considered as acting at panel point No. 3. Its lever arm is 11.5 feet. The moment caused by it is 46,000 foot-pounds. The lever arm of R_2 around R_1 is 34.8 feet. It must be remembered that a moment is the product of a force multiplied by the *perpendicular* distance from the center of moments. R_1 is the center of moments in this case. R_2 multiplied by 34.8 must equal 46,000 foot-pounds. So $46{,}000 \div 34.8 = 1{,}322 = R_2$. $4{,}000 - 1{,}322 = 2{,}678$ pounds $= R_1$.

Once the reactions are determined, they can be laid off on the stress diagram. R_2 in this case is *F'A* and *f'a* laid off on the line *bf'* places *a* just below *e*. *ab* gives the left reaction, which equals 2,678 pounds. We now have *bc, cd, de, ef, ff' f'a* and *ab*. The remainder of the stress diagram is laid off in the same manner as those given before. As the points *g* and *h* coincide with each other, the member *GH* in the truss diagram has no stress in it and might as well have been omitted, except that it acts as a support to keep the lower members of the truss from sagging. It will also be found that there will be no stress in *m'l'*, *l'k'*, and like members on the right hand side of the truss when the wind is from the left. This is shown by the fact that *m'* and *l'* coincide with each other.



FIGVRE 69

In order to make use of the diagrams already drawn it is necessary to make a table. In this table there must be spaces for the members of the truss and opposite each member is recorded the stress in it, first, when the load is vertical, second, when the wind blows from the right, third, when the wind blows from the left, and the sum of those stresses that give the greatest total stress. Each stress must be marked plus or minus to indicate if it is a tensile or compressive stress. The actual design of the members is then undertaken.

So far no attention has been paid to the condition in which one end of the truss is free. This problem will be dealt with in the next article as well as a few considerations dealing with the design of the truss.

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EDITORIAL

THE LABOR UNION AND THE ARCHITECT—ADVERTISING THE ARCHITECT

THE labor unions have in the past let the Architect pretty well alone, but there has of late appeared a tendency on their part to inform the Architect in advance just what contractors they would consider "fair" for some particular piece of work of which they have obtained knowledge, and also to send him copies of the union rules regarding conditions of labor, and also regarding how the work should be divided among the several trades. These things tend to make an uncomfortable condition of affairs for the Architect; he certainly does not want to involve the owner in any controversy with the unions, and on the other hand he regards the contractor as being the man to whom such communications should be addressed. The latter position is certainly a tenable one, even from the viewpoint of the union, for the union rules provide that no union man shall be given orders direct by a non-union superintendent, so that the Architect's superintendent or clerk of the works, is prohibited from taking up direct with the mechanic some particular process of brick laying or of tile setting, and must issue his instructions through the contractor's foreman. Therefore it would seem perfectly reasonable for the unions to present their instructions on union rules to the Architect through the contractor.

As a matter of fact, however, the courtesy and intelligence of the average mechanic leads him to disregard this rule and to accept willingly and pleasantly the instructions of the Architect without intermediary. In a like manner it would seem that notifications of "fair" lists of manufacturers might be received by the Architect through courtesy, without assuming any right or privilege on the part of the unions to dictate to him his choice of contractors.

The position of the Architect is, however, made difficult by such communications and it is probably unwise in the unions to issue them, because the average Architect who has been practicing any time, knows from experience that all the good mechanics are unionized, and as he has control over the sub-contractors through a usual clause in the specifications that sub-contractors must be approved by him, he is able to see that proper union mechanics are employed, thus avoiding the difficulties which arise from the use of non-union men. As this condition of affairs is probably universal through the Architects' offices in New York City, it would seem very much better that the building trades should not force the Architect's hand since many of the men for whom the Architect acts are bitterly opposed on principle or through ignorance to the union idea. A clause in the Uniform Contract also provides that the contractor is held responsible for delay caused by strikes arising on the job which the contract covers, which means in practice, though perhaps not in theory, that conditions of labor must be satisfactory to the union men. These being facts, as they unquestionably are, there is no point which the unions could gain by approaching the Architect direct, and while it is perfectly true that communications addressed by the representatives of the unions to the Architects are couched in the most careful terms, there is an implied threat of trouble unless the Architect refuses to use certain manufacturers and contractors, and unless his specifications accords with the union rules.

Now human nature is such that this is the very sort of thing which is liable to stir up unfriendly feeling between the Architects and mechanics, and is liable to stir up this feeling over utterly immaterial things. The Architects and the unions always got along very well; the Architects want union men, and the unions must work from drawings of some kind or another.

One possible source of trouble between the Architects and the unions arises from the desire on the part of the Architects to secure certain special work which is outside of the scope of the usual mechanic's knowledge and ability, although executed in materials similar to those in which he is customarily working. A case arose one or two years ago which was the cause of much friction; an Architect had made by a sculptor and cast in the sculptor's studio, some ornamental bosses and reliefs for a cornice, and these the unions declined to erect on the ground that they were made by non-union men, and should have been made (according to their rules) by the union ornamental plasterers. It is quite possible that, as the union alleged, there were within the union ranks some men of sufficient sculptural ability to model and execute the ornament referred to, yet on the other hand it would have been very difficult for the Architect to secure exactly the results he desired except from a man who was accustomed to working with him, and of whose ability he had knowledge. He would hardly have time to sift the ranks of the plasterers' union for the two or three men whose ability was adequate, and who could work sympathetically with him.

A not dissimilar condition arose on some bronze doors which were cast in the union bronze foundry, and instead of being retouched by the sculptor in his own studio, were chased by him after they had been set in place.

The union who erected the doors claimed that this work should have been done by them, although it was manifestly outside of the ability of any one of the men. These two instances are, of course, extreme, and not liable to occur except where there is friction on the job in other respects, and probably more tactful handling of the situation by the Architect would have avoided the difficulty, yet it would certainly seem that a less technical interpretation of union regulations would have been proper.

The point at which trouble most usually occurs is through specification of some particular line of goods which is not made by the union shop, and which in consequence the local unions decline to erect. The big western door manufacturers, in some cases, do not run union shops, and most of the manufacturers of iron work run "open shops." Union men will sometimes refuse to erect material from these shops. No one feels that their position in this respect is entirely unjustified, since the term "open shop" is a complete misnomer, and manufacturers who profess to run "open shops" are usually hypocritical in making such a statement. One rather well known manufacturer was asked if he employed union men in his "open shop." "Not if we catch them" was his reply, and with a spirit like this on the part of the manufacturers, the union can hardly be blamed for assuming that the "open shop" means a non-union shop.

The real reason why it seems a mistake for the unions to approach the Architect direct is that specification of union materials would lead to a direct issue between the owner and the unions, a thing which a tacit acceptance by the Architect, of conditions as they are, avoids. It is to be hoped that the pleasant existing relations between the Archiects and the unions will not be disturbed by interference which the Architect may regard as unwarranted.

THE Architect notes with pleasure how constantly advertisements of materials give him credit, for not only is he gratified at the evident feeling on the part of the manufacturers that the use of their materials in a building designed by him is worth letting the public know about, but also the Architect is getting a good deal for nothing.

The list of manufacturers who habitually attach the Architect's name to illustrations of buildings in which their products are used, includes practically the whole of the building trades, and as in many cases advertising is not confined to the technical press, but also is known through the current magazines devoted to general literature, the Architect's name is made familiar not only to the profession, but also to the general public from whom clients may be expected. It is contrary to the policy of ARCHITECTURE to name specific advertisers elsewhere than in the advertising pages, so we refrain from mentioning names to confirm this, but a glance over the advertising pages of "The Century" or "McClures" or the "Saturday Evening Post" will be sufficient to convince any one of the truth of this.

Another thing which the larger manufacturers have been doing is to prepare excellent booklets, showing good examples of architecture in which their products were used. Three such come to mind at once; one published by a heating concern, one by a cement company, and one by a manufacturer of brick. In all cases the Architects names are given in full, and in some cases their addresses are added, and in each one of these books people intending to build are advised to go to a good Architect and not to attempt to do their work without one. In one case the manufacturers even went further and had an article prepared by an Architect stating as fully and plainly as could be done what the Architect does, and why a low scale of charges results in poor work. This piece of literature might well have been sent out by the American Institute of Architects instead of by a manufacturing concern had the Institute desired to educate the public as to the duties and obligations of the Architect, but the Institute has not the facilities of placing this in the hands of people intending to build that a powerful manufacturing organization has, and even the Institute would be unable to do quite as much good to its members as has this independent concern, working primarily for its own benefit, but endeavoring to interest the public first in good architecture confident that their material is of such high grade that its use will naturally follow. The greatest difficulty that Architects find, especially in the matter of charges, is to convince the public that a few drawings actually cost money, and are worth something; and that the Architect works for something beside the mere pleasure of working at all. No organized campaign has yet been conducted by the Architects to directly inform the public as to the conditions of their profession and their prices; therefore this matter has been left to the efforts of individual Architects, which does not carry the weight that the efforts of an organization would; and manufacturers' statements in regard to the Architect are often accepted by a client with less reserve than those offered by practitioners, since they seem to have been made by a disinterested third party.

The only way in which Architects can help this campaign is to assist the manufacturers in every way by placing at their disposal photographs of executed buildings and by giving permission to have their names attached, and while most men are broad enough to appreciate the general advantages to the profession, even where there are no specific advantages to the individual, a few have not met the efforts of the manufacturers with that courtesy which is becoming the high position that an Architect holds. An Architect whose work is continually published finds that the mere duplication of photographs necessary is a considerable financial strain from which he can see no direct result, but even when the result is of no benefit to one particular man, everything which can be done to focus the eye of the public on the Architect, who is largely responsible for the quality of our structures and the general conditions in our towns, is favorable to the profession.

The Architect cannot claim to be quite so important to the health and comfort of the public as the doctor, but with the exception of the medical profession there is probably none which touches so closely the conditions of every day life. Architects are more and more regarded as essential members of the boards which have to do with the planning of cities, the location of public utilities, the housing problems of the poor, the determination of sites for monuments, the codification of laws dealing with strength of materials; and the far sighted point of view which the practice of the profession gives to its members has been found useful to the public. This utility can be greatly increased by a more complete appreciation of the fact by the public, and every piece of advertising which helps to bring the Architect into the public eye is useful, especially when it is as dignified in tone that is usually the case by the manufacturers.

"BEFORE passing hasty judgment upon the Architect of our times, think a moment of the evil days upon which he has fallen," says the *Engineering Record*. In the Mediæval times he must perforce know only the technique of masonry—the rest was his art. If he were building a church the fine stimulus of the Gothic was his inspiration, and his medium was craftsmanship in stone. Today he must know masonry and concrete, structural steel, and sanitary plumbing, lighting and heating, electric wiring and acoustics. His predecessor did not have to plan for buying his stone from one source; his steel from another, and his woodwork from a third; he was not hounded by agents of patented devices, nor pestered by circulars of supplies offering him 'the usual Architect's commission of —— per cent.' All these things the Architect of today has to endure, besides being called a slavish copyist if he turns to the best in antiquity, and a commonplace innovator if he does not. His chief hope is in suiting himself as best he may to new conditions, calling in technical advisers on the details which he cannot in the nature of things have time to master, even if he has the ability, standing the more firmly by the interests of his client as he confronts a regiment of sub-contractors, and remembering that he must be artist before being engineer or contractor. Originality and resourcefulness are much more difficult to find than technical or constructional skill, and if the Architect is to be more than a master mason or boss concrete mixer, it must be by the possession of these attributes. Art did not die with the Gothic nor perish with the Romanesque. The times have changed, and the Architect must change with them."

THE question of extras and omissions from a building contract is often a very serious one; the greatest care should be used by the Architect, so as not to exceed the work shown in the contract drawings and specified. When preparing the detail drawings, they should be carefully compared with the small scale drawings before they are signed and sent from the Architect's office, and if there is any extra it should be ordered in writing. If the drawings are not carefully examined by the builder, or his staff, and compared, the work is set in hand, omissions are discovered later on, and an extra is asked for, which, if left until the variations are gone into, is often disputed. There is no doubt that, in fairness, any detail drawing that shows variation from the original one should be treated as a variation, and considered as an order for it, to be added or deducted at the end.

Where there is a sum provided in the contract for extras, the Architect should do his best to avoid spending more than that sum; it will make the account a much pleasanter one to present to his client. Where extra work is ordered on the site, the order should be written and signed in the foreman of works' diary or day-book, pending a proper order being sent from the Architect's office.

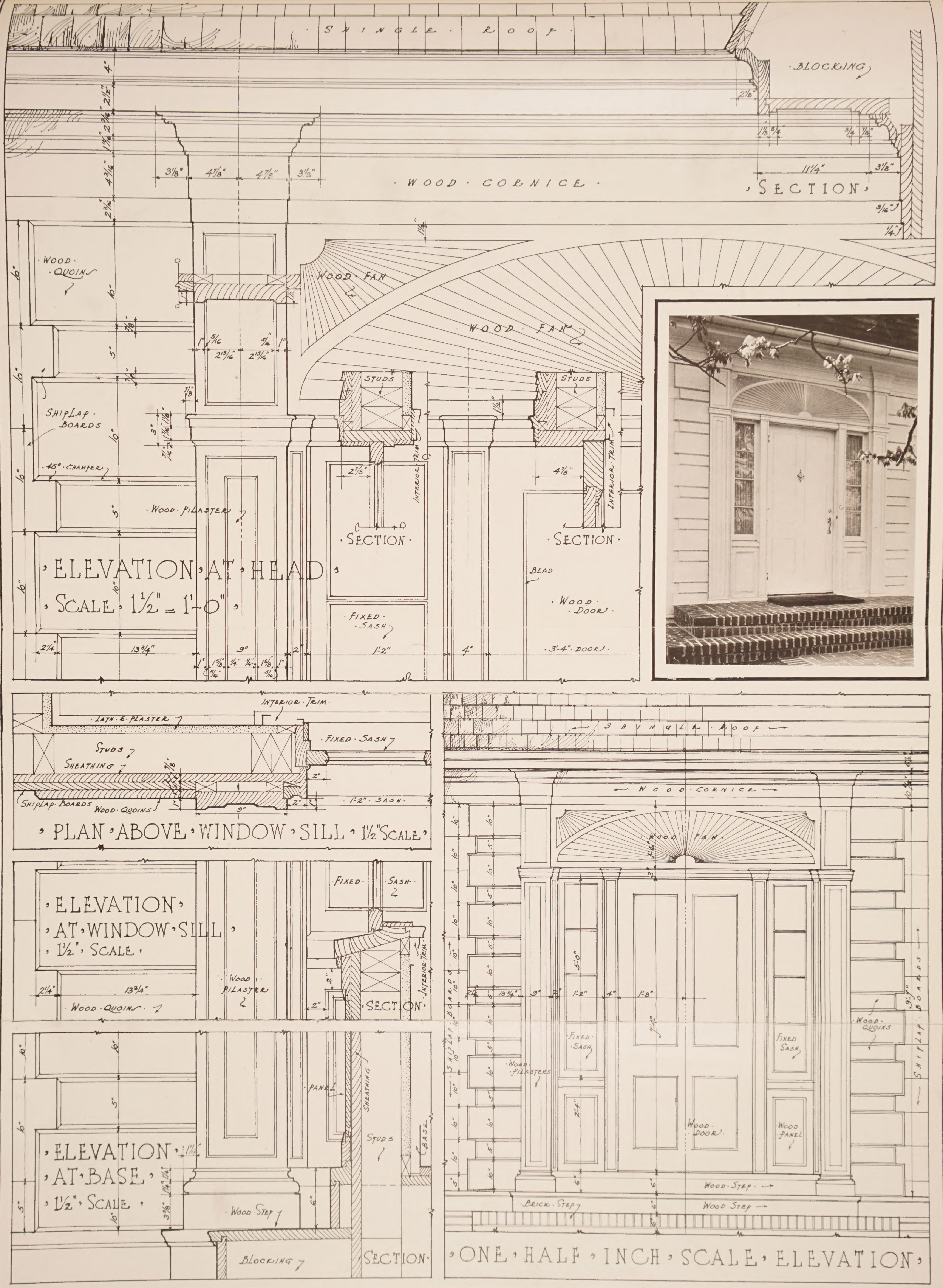
If the builder finds any work shown in the details which is, in his opinion, an extra, he should write to the Architect and point it out, and wait for an order before putting the work in hand. This would save a lot of trouble when the accounts are gone into at the finish of the work, or sooner if needed.

REINFORCED concrete roof-tiles have been placed on a number of buildings constructed in connection with the Catskill Aqueduct, according to the last report of the Board of Water Supply of New York City. The tiles were made of 1:2 mortar reinforced with 1½-in. by 3-in. wire mesh. All tiles except the hip-tiles were made with the weather surface up, shaped and surfaced with special steel screen. In place, they also stood well under rains and snows, showing no leakage at any time.

HUBERT VAN WAGENEN, Junior, Architect, died suddenly on April 23rd at French Lick Springs, Indiana, in his 38th year. His architectural education was obtained at Columbia University of which he was a graduate; at the Ecole des Beaux Arts, Paris, and in prominent New York offices.

In 1904, while abroad, he won the Columbia Fellowship in Architecture and traveled extensively throughout Europe. Mr. Van Wagenen started to practice his profession in 1906 when the firm of Nelson & Van Wagenen was formed, and designed many prominent building in New York and its vicinity.

Mr. Van Wagenen was a member of the Society of Beaux Arts Architects, The Architectural League of New York, The New York Yacht Club, The Rockaway Hunt Club, The Cedarhurst Yacht Club, The Automobile Club of America and the Alpha Delta Phi Fraternity.



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